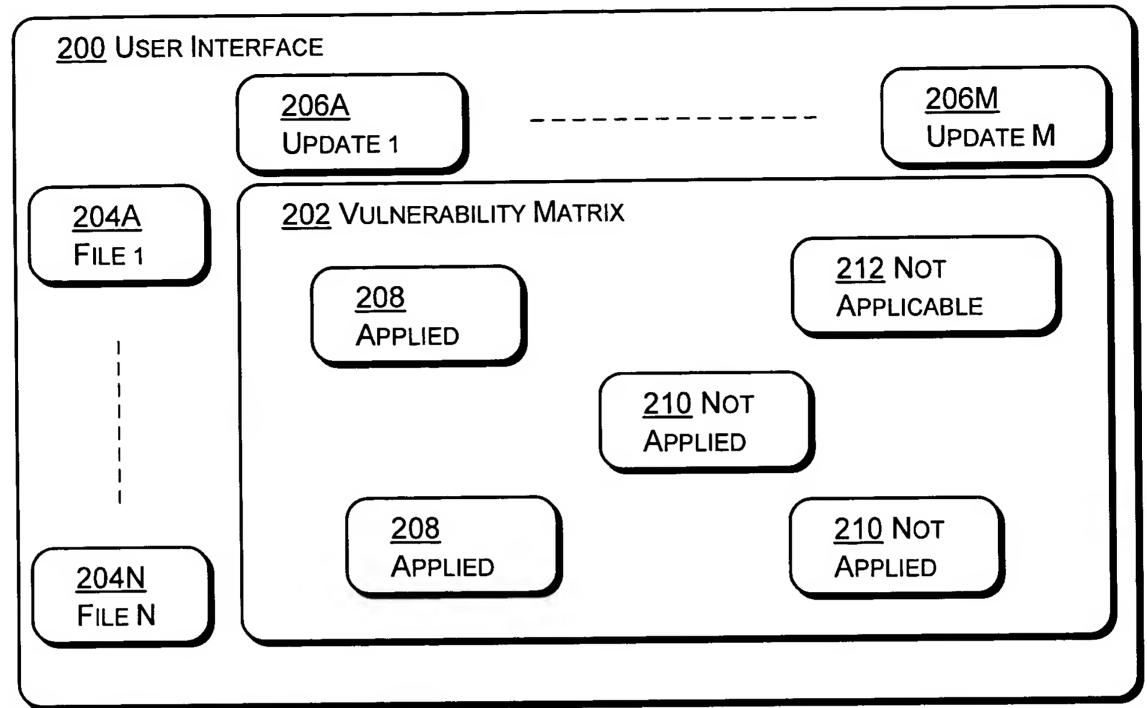
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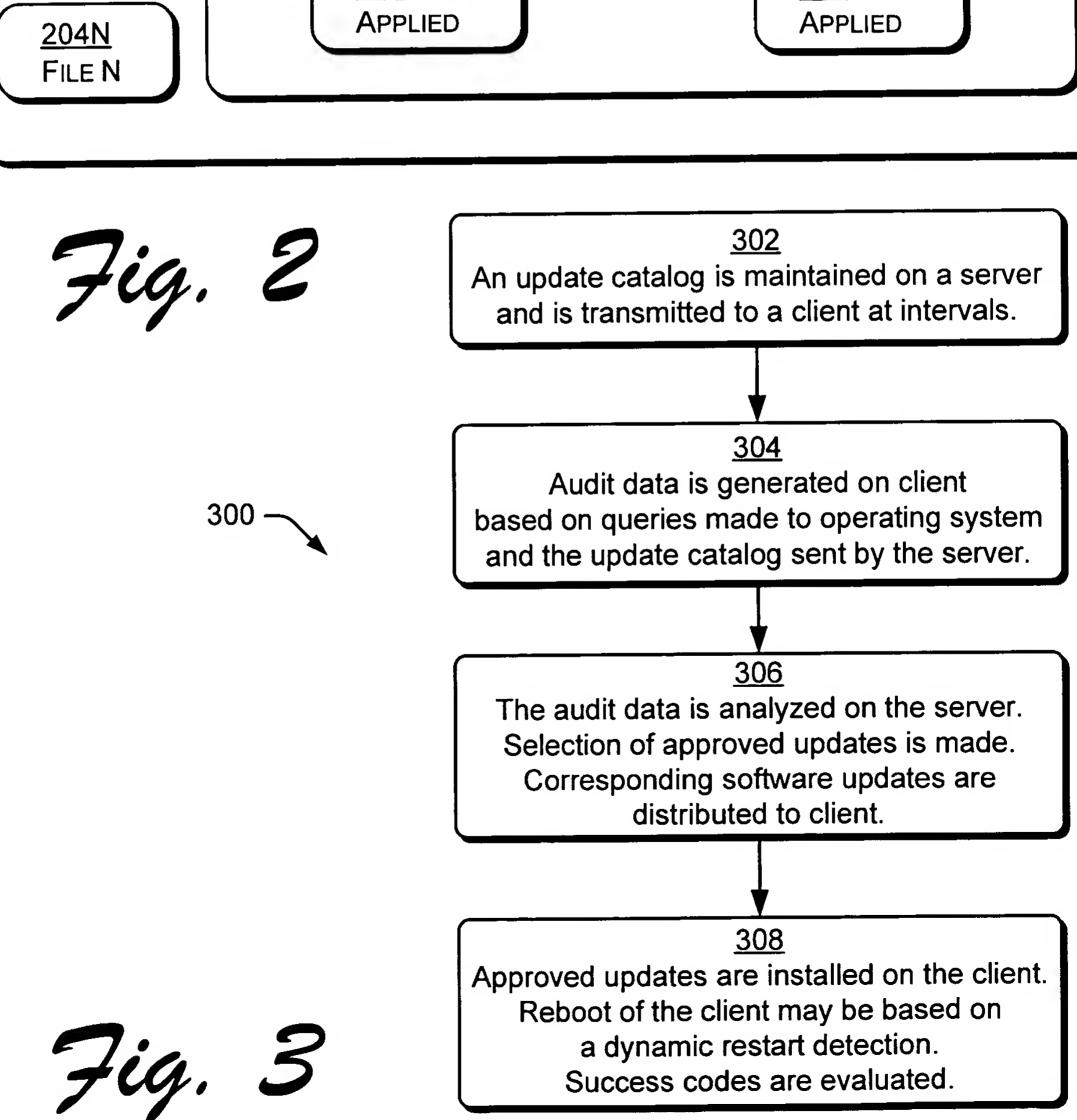
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102 SERVER 116 UPDATE CATALOG 108 OPERATING SYSTEM 120 SOFTWARE UPDATE 110 SMS SITE SERVER **APPROVAL TOOL** 122 AUDIT DATA 112 XML PARSER 124 UPDATE DOCUMENT 114 CATALOG SYNCHRON-IZATION MODULE **126** UPDATE <u>106</u> **118 UPDATE DOWNLOAD** Network **AUTHORITY** CENTER **104** CLIENT 140 SCAN ENGINE 128 OPERATING SYSTEM 142 AUDIT DATA 130 XML PARSER 144 SCAN TOOL HELPER 132 SMS CLIENT 146 SOFTWARE UPDATE INSTALLATION AGENT 148 SUCCESS 134 WINDOWS MANAGE-**CODE TABLE** MENT INSTRUMENTATION (WMI) 150 APPROVED UPDATE **DOCUMENT** 136 UPDATE CATALOG 152 SCAN TOOL CACHE 138 SCAN TOOL MODULE

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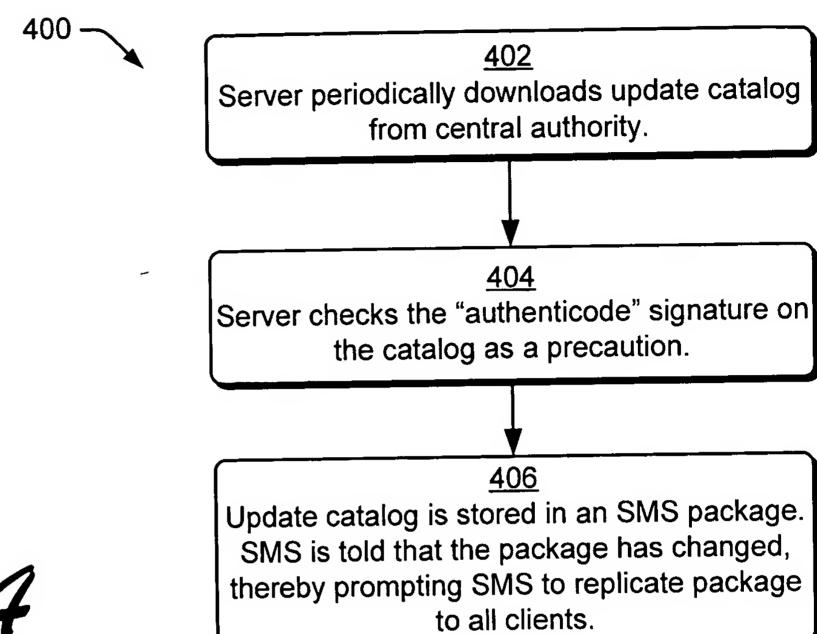


Fig. 4

SMS is alerted to replicate data to server.

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600 —

<u>602</u>

The scan engine reads the XML file contained in the update information.

604

The scan engine queries the operating system to determine the existence of files to which reference was made in the update information.

<u>606</u>

The rules contained in the update document are then applied, to determine the files to which an update should be applied, and the identity of the update.

<u>608</u>

The scan engine returns the audit data to the scan tool.

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702

User interface is opened, thereby allowing an IT technician using the server to view audit results for one or more client systems.

704

A vulnerability matrix is generated and displayed. The vulnerability matrix shows client file inventory, recommended updates and indication of whether update was applied.

706

User interface allows IT technician to indicate select approved updates.

708

Approved updates are selected from group of updates having passed testing on a test collection.

<u>710</u>

Required updates are obtained from an appropriate download center.

<u>712</u>

Suppression of reboot may be indicated for different updates.

714

Updates may be classified for dynamic rebooting.

716

Approved updates are transferred to client via SMS.

700

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802 A user interface is opened, giving a user the opportunity to have updates installed. 804 A countdown timer causes appropriate default actions to be taken if no one is present at the client computer. 806 Where grace period has ended and enforcement period has started, the "postpone" option is eliminated. 808 The appropriate scan tool from the scan tool cache is executed for a just-in-time assessment of the client. <u>810</u> The WMI class is queried, and the result intersected with the list of approved updates received from the server. <u>812</u> Each update is checked to see if an enforcement period has been

reached.

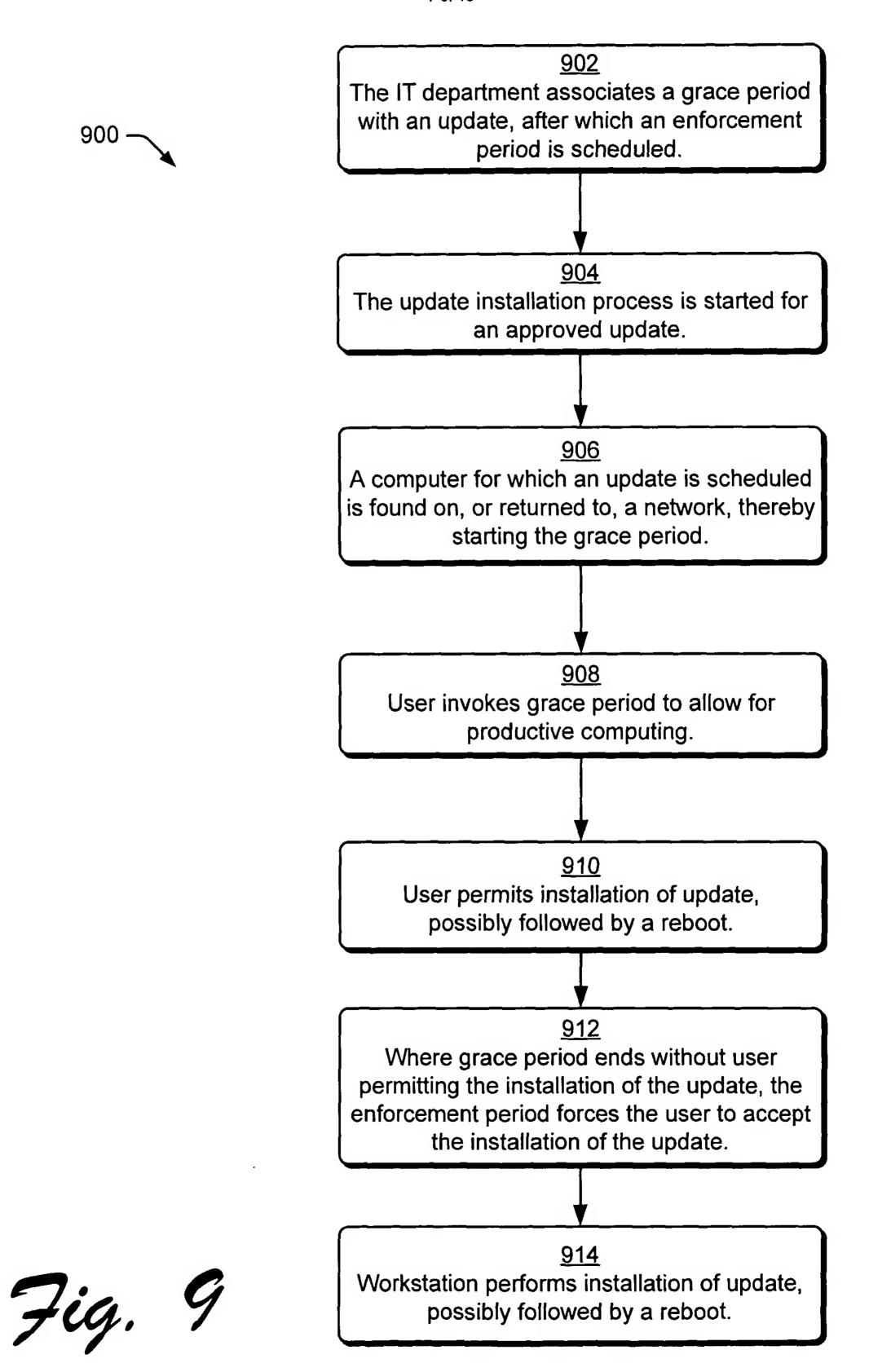
800 814 For each approved update that is enforced and applicable, the update is installed using the meta-data included in the XML file. 816 Following the install, a status message is issued for each update, and a summary event for overall status of the evaluation/installation cycle is also issued. Success code mapping may be performed. 818 Service level data is transmitted to the software update approval tool. 820 The WMI class is updated to reflect newly installed updates, and the SMS inventory process is conditionally started. 822 Determination is made if a system reboot is needed, and a check is made to ensure that the system is

Fig. 8

permitted to be reboot.

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<u>1002</u>

1000

Updates are associated with rebooting instructions, thereby informing the software update installation agent of the rebooting requirements.

1004

Where an update was designated as an exclusive primary update, the update is applied individually prior to other updates, to be followed by a reboot.

1006

Updates designated for exclusive installation and reboot are installed individually and the system is rebooted.

1008

Where an update was designated for automatic reboot determination, a reboot is performed only if indicated by conditions found after the install.

1010

Where a reboot was designed as being "always" or "never" indicated, the reboot is performed, or not performed, as indicated.

1012

Where suppression of the reboot was indicated, the reboot is delayed until an appropriate time.

Annoyance mode may be invoked.

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1100

1102

Following installation of an update, a success code table is consulted, and the success code resulting from the update installation is checked.

1104

Where the update installation was part of a testing procedure, the IT technician may edit the success code table.

<u>1106</u>

Where the success code table is being edited, the table may be organized by groups, wherein the groups may be associated with update installation engine technology.

1108

The IT technician may further edit the success code table to accommodate the installation of updates resulting in codes which are exceptions to general rules.

1110

In a non-test environment, upon location of a success code within the success code table, the results of the success code are interpreted according to a mapping process resulting from operation of the table.

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1202

Notification icon is visible to user at all times.

1200

1204

Right-clicking icon provides a choice between "Display Reminders" and "Install Software Updates"

1206

The Display Reminders option reveals the grace and enforcement periods that the corporate IT administration has associated with the updates.

1208

The Install Software Updates selection provides user interface which allows the user to schedule the installation of the updates.

1210

Reminder is periodically shown (e.g. at start up and at intervals) to the user which reminds of the updates needed and of the timing of the grace and enforcement periods.

1212

Updates and reboots are performed according to the user's schedule or automatically, at the end of the grace period.

<u>1214</u>

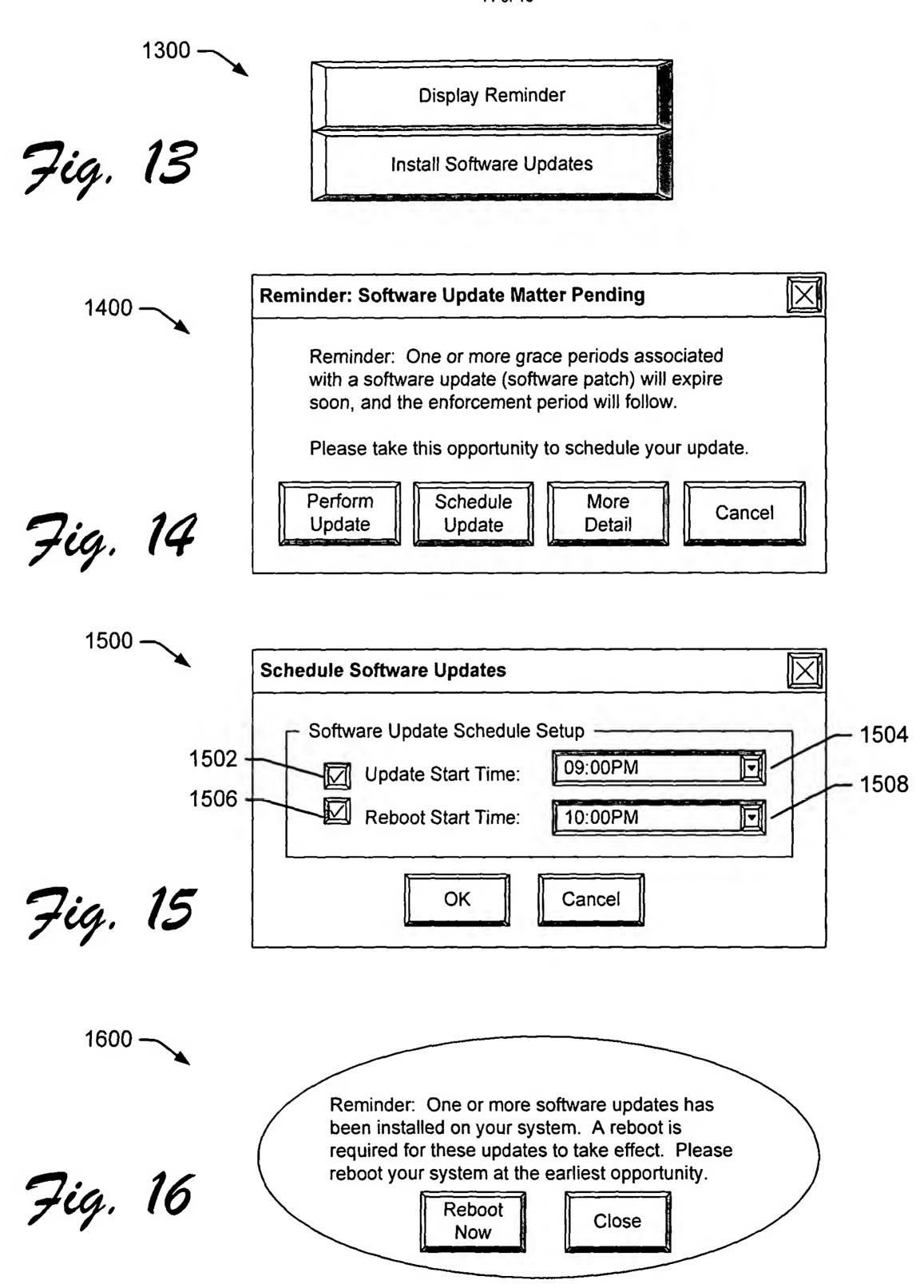
Where a reboot was not performed, such as due to a postponement, annoyance mode prods the user to reboot.

1216

Reboot is performed, thereby bringing updates into service.

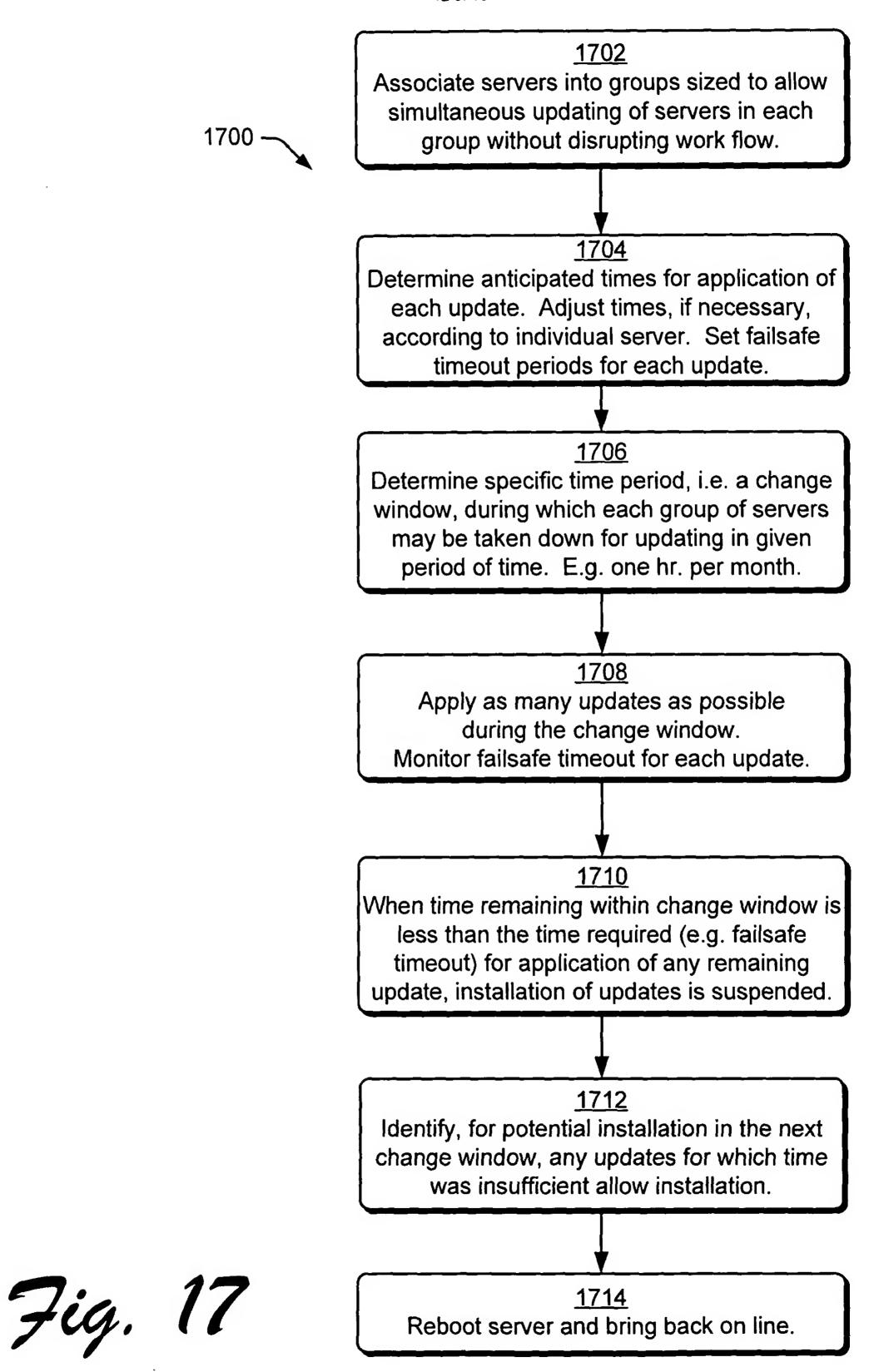
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1800 <u>1802</u> A large number of updates are grouped into a single package. <u>1804</u> The package is configured with content from a trusted authority of update content. <u>1806</u> The package is configured to support differential enforcement as applied to different client computers. 1808 The package is configured for SMS consumption. <u>1810</u> The package is distributed to a plurality of clients, wherein the clients are associated with multiple service levels. **1812** The content in the package is applied differentially according to requirements of

each client group.

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1902
A partition is formed within a package containing large number of updates.

1904
The partition may separate trusted updates from un-trusted updates.

1906
The partition is expressed using an XML file configured to inform different clients of the updates suitable for their consumption.

1908
Trust of the updates within the package is based on performance within a test environment.

Fig. 19

<u>1910</u>

Un-trusted updates are merged with trusted

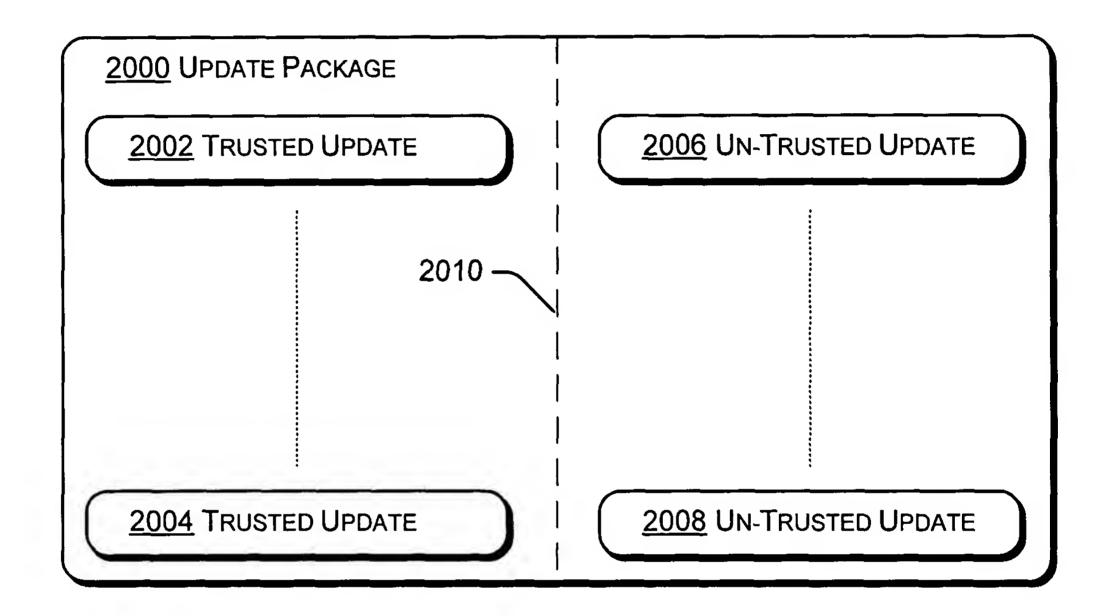
updates after approval process in test

environment. The merger may be

accomplished by editing the XML document.

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2100

2102

A file, such as an XML file, is opened to record information including updates approved for a reference computer.

2104

A template mode feature scans a reference system and generates an authorization list of updates associated with a standard image.

2106

Authorization list is incorporated into the template, which is written to the XML file.

2108

Template can be consumed and deployed as a mirror of the desired state.

2110

The deployed template is used to speed time from update detection to update deployment.

2112

Client computers are updated according to the template.